WHAT IS CLAIMED

1. A telescoping boom structure comprising a plurality of tubular boom sections having respectively different diameters, and being concentrically nestable about a common displacement axis, and having helical tracks through which adjacent tubular boom sections mutually engage one another for telescoping displacement along said common displacement axis.

2. The telescoping boom structure according to claim 1, wherein a first tubular boom section has a helical track formed along an exterior tubular surface thereof, so as to be engageable by one or more rotational elements retained at an interior surface of a second tubular boom section having a diameter greater than that of said first tubular boom section.

3. The telescoping boom structure according to claim 2, wherein a third tubular boom section has a helical track formed along an exterior tubular surface thereof, so as to be engageable by one or more rotational elements retained at an interior surface of said first tubular boom section, which has a diameter greater than that of said third tubular boom section.

4. The telescoping boom structure according to claim 2, further including a drive motor coupled to rotationally drive said second tubular boom section, and

wherein said one or more rotational elements are retained at said interior surface thereof about said common displacement axis, so as to cause said one or more rotational elements of said second tubular boom section to engage and rotate said helical track of said first tubular boom section, thereby causing displacement of said first tubular boom section relative to said second tubular boom section along said common displacement axis.

5. The telescoping boom structure according to claim 4, wherein said first tubular boom section further includes a stop element adjacent to a terminal portion of said helical track of said first tubular boom section, said stop element being operative to engage a rotational element of said second tubular boom section and prevent further rotation of said helical track of said first tubular boom section relative to said second tubular boom section.

6. The telescoping boom structure according to claim 5, wherein said stop element is formed in said helical track.

7. An expandable structure-deploying actuator mechanism comprising a plurality of concentrically nestable tubular boom sections, that are mutually engageable with one another by way of roller assemblies and helical tracks formed thereon, so that the tubular

boom sections may expand telescopically along a deployment axis by means of a rotational drive actuator coupled to one of said tubular boom sections.

8. The expandable structure-deploying actuator mechanism according to claim 7, wherein adjacent ones of said concentrically nestable tubular boom sections are mutually engageable with one another by means of a helical track formed on an outer cylindrical surface of a relatively radially interior tubular boom section, and associated rollers formed on an inner surface of a relatively radially exterior tubular boom section and being arranged to ride along said helical track.

9. The expandable structure-deploying actuator mechanism according to claim 8, wherein a radially outermost tubular boom section contains interior roller assemblies, but no outer helical track, while a radially innermost tubular boom section contains an outer helical track, but no interior roller assemblies.

10. A method of deploying a plurality of concentrically nestable cylindrically configured boom sections along an axis about which said boom sections are concentric, said method comprising the steps of:

(a) providing outer surfaces of said boom sections with helical tracks;

(b) providing interior surfaces of said boom sections with roller assemblies that are positioned to

engage helical tracks of radially interiorly adjacent boom sections; and

(c) imparting a rotational drive to a selected one of said concentrically nestable cylindrically configured boom sections, so as to cause a roller assembly of said selected boom section to engage a helical track of a radially interiorly adjacent boom section, and thereby cause linear displacement of another, radially interiorly adjacent boom section along said axis.

11. The method according to claim 10, wherein said selected one of said concentrically nestable cylindrically configured boom sections corresponds to a radially outermost one of said concentrically nestable cylindrically configured boom sections.

12. The method according to claim 10, wherein said radially interiorly adjacent boom section includes a stop element adjacent to a terminal portion of the helical track thereon, said stop element being operative to engage a roller assembly of said selected one of said concentrically nestable cylindrically configured boom sections.

13. The method according to claim 12, wherein said stop element is formed in said helical track.